
वस्त्रादि — रडार अनुक्रियाशील लक्ष्य बैनर का
कपड़ा — विशिष्टि
(पहला पुनरीक्षण)

**Textiles — Fabric for Target Banner,
Radar Responsive — Specification**
(*First Revision*)

ICS 59.080.50; 49.025.01

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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by Textile Materials for Aeronautical and Related Products Sectional Committee had been approved by the Textile Division Council.

This standard was first published in 1973 and has been revised to align it with latest trade practices.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILES — FABRIC FOR TARGET BANNER, RADAR RESPONSIVE — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the constructional details and other particulars of fabric used in the manufacture of radar responsive target banner towed behind aircraft for giving air to air and ground to air firing practice in conjunction with radar devices.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 MATERIAL WORKMANSHIP AND FINISH

3.1 The fabric shall be manufactured from polyethylene monofilament and metallizing elements consisting of duraluminium or silver coated copper filament. Metallizing element shall be introduced in the weave of the fabric to give 24 filaments per 10 cm in the weft and 16 per 10 cm in the warp. The polyethylene monofilament shall have a nominal diameter of 0.5 ± 0.05 mm and it shall be neither pigmented nor heat treated. Metallizing element made from duraluminium or silver coated copper filament shall be flattened to form a strip of 0.35 mm wide having a thickness of 0.02 mm. The weave of the fabric shall be leno.

3.2 In respect of the requirements not covered in this standard, the fabric shall not be inferior to the sealed sample as agreed to in the contract or order.

4 REQUIREMENTS

4.1 The fabric shall meet the requirements given in Table 1.

4.2 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

**Table 1 Requirements of Fabric for Target Banner,
Radar Responsive**

(Clause 4.1)

| SI No. | Characteristic | Requirement | Method of Test |
|--------|--|-----------------|------------------|
| (1) | (2) | (3) | (4) |
| 1 | Length, m, Min | 20.5 | IS 1954 |
| 2 | Width, cm | 184^{+0}_{-2} | IS 1954 |
| 3 | Width of selvages, cm | 5 ± 1 | — |
| 4 | No. of ends in selvedge | 55 ± 3 | — |
| 5 | Weight, g/m ² | 300 ± 20 | IS 1964 |
| 6 | Ends per dm | 58 ± 2 | IS 1963 |
| 7 | Picks per dm | 50 ± 2 | IS 1963 |
| 8 | Breaking strength (Warp and Weft) on 10×20 cm strip, Kgf, Min | 100 | IS 1969 (Part 1) |
| 9 | Width of closely woven strip in the middle of the fabric, cm | 5 ± 1 | — |
| 10 | No. of ends in closely woven Strip | 55 ± 3 | — |
| 11 | Coefficient of radar reflectance (Approx) | | — |
| | a) 'S' Band | 0.8 | |
| | b) 'X' Band | 0.8 | |

5 ATMOSPHERIC CONDITIONS FOR TESTING

5.1 The tests shall be carried out in the standard atmosphere (*see 5.2*).

5.2 Conditioning of Test Specimen

The test samples shall be conditioned to a state of moisture equilibrium from dry state in standard atmosphere at 65 ± 5 percent relative humidity and 27 ± 2 °C temperature (*see also* IS 6359).

6 MARKING

6.1 Each roll of fabric shall be legibly marked with the following information:

- Name of the material;
- Length of piece contained in a roll;
- Year of manufacture; and
- Manufacturer's name, initials or trade-mark, if any.

6.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

7 PACKING

Unless otherwise specified in the contract or order, each roll of fabric shall be tied with 3-ply jute twine (*see IS 1912*) and suitably wrapped with an inner layer of kraft paper and an outer layer of polyethylene film (*see IS 2508*) of at least 40 micron thickness.

Six such rolls shall be placed one over the other and then wrapped with heavy cee cloth (*see IS 3751*) to form a bale.

8 SAMPLING

8.1 The lot shall consist of all the rolls of fabric delivered to a buyer against one despatch note.

8.2 Unless otherwise sampling plan is specified in the contract or order, the sampling plan as given in Table 2 may be used for inspecting and testing of fabric against this standard. The number of rolls to be selected from the lot for assessing manufacture and workmanship (*see 3.1 and 3.2*) and testing width, ends, picks and weight shall be as per col 2 of Table 2. The number of test specimens to be selected for other tests shall be in accordance with col 4 of Table 2. To ensure the randomness of selection, IS 4905 may be followed.

8.3 Criteria for Conformity

The lot shall be declared conforming to the requirements of this standard if the total number of defective samples does not exceed the permissible numbers given in col 3 or col 5 of Table 2 as applicable.

Table 2 Sampling Plan for Fabric for Target Banner, Radar Responsive
(Clause 8.2)

| Lot Size | Sample Size | Permissible No. of Defectives Samples | Sub-Sample Size (to be drawn from sample) | Permissible No. of Defectives Sub-Samples |
|----------------|-------------|---------------------------------------|--|---|
| (1) | (2) | (3) | (4) | (5) |
| 2 to 25 | 3 | 0 | 3 | 0 |
| 26 to 90 | 13 | 1 | 3 | 0 |
| 91 to 150 | 20 | 2 | 13 | 1 |
| 151 to 280 | 32 | 3 | 13 | 1 |
| 281 to 500 | 50 | 5 | 20 | 1 |
| 501 to 1200 | 80 | 7 | 32 | 2 |
| 1201 and above | 125 | 10 | 50 | 3 |

NOTE — If sample size equals or exceeds lot size, carry out 100 percent inspection.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

| <i>IS No</i> | <i>Title</i> | <i>IS No</i> | <i>Title</i> |
|--------------|---|---|--|
| 1398 : 1982 | Specification for packing paper water proof, bitumen-laminated (<i>second revision</i>) | 1969 (Part 1) : 2018/ ISO 13934-1 : 2013 | Textiles — Tensile properties of fabrics: Part 1 Determination of maximum force and elongation at maximum force using the strip method |
| 1912 : 1984 | Specification for country jute twine (<i>second revision</i>) | 2508 : 2016 | Polyethylene films and sheets — Specification (<i>third revision</i>) |
| 1954 : 1990 | Determination of length and width of woven fabrics — Methods | 3751 : 1993 | Textiles — Heavy jute cloth — Specification (<i>first revision</i>) |
| 1963 : 2004 | Methods for determination of threads per unit length in woven fabrics | 4905 : 2015/ ISO 24153 : 2009 | Random sampling and randomization procedures (<i>first revision</i>) |
| 1964 : 2001 | Methods for determination of mass per unit length and mass per unit area of fabrics | 6359 : 1971 | Method for conditioning of textiles |

ANNEX B*(Foreword)***COMMITTEE COMPOSITION**

Textile Materials for Aeronautical and Related Products Sectional Committee, TXD 13

| <i>Organization</i> | <i>Representative(s)</i> |
|---|---|
| Aerial Delivery Research and Development Establishment, Agra | SHRI A. K. SAXENA (Chairman) |
| Air Headquarters, Ministry of Defence, New Delhi | GP CAPT S. K. CHATTERJEE WG CDR S. NAGRAJAN (<i>Alternate</i>) |
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| RCMA, Kanpur | SHRI P. K. SHUKLA SHRI ALOK KUMAR (<i>Alternate</i>) |
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Member Secretary

SHRI P. N. MURALI
SCIENTIST 'D' (TEXTILES), BIS

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